

REMARKS

Reconsideration and allowance are respectfully requested.

Claims 1, 5-14 and 17-20 are pending. Claims 1, 5-10, 12-13 and 17-19 are allowable. Lines 5) and 6) of the Office Action Summary are incorrect, and it appears that the listed claims should be switched.

The amendments are supported by the original disclosure and, thus, no new matter has been added.

Return of an initialed copy of the Form PTO-1449 originally submitted as part of the Rule 116 Amendment is requested.

35 U.S.C. 101 –Utility

Claim 11 was rejected under Section 101 because it is allegedly "directed to non-statutory matter." Applicants traverse because the present amendment was suggested by the Examiner to overcome the rejection.

Withdrawal of the Section 101 rejection is requested.

35 U.S.C. 102 – Novelty

Claim 11 was rejected under Section 102(b) as allegedly anticipated by Wu et al. (U.S. Patent 5,981,842). Applicants traverse because the present amendment was suggested by the Examiner to overcome the rejection.

Withdrawal of the Section 102 rejection is requested.

35 U.S.C. 103 – Nonobviousness

To establish a case of prima facie obviousness, all of the claim limitations must be taught or suggested by the prior art. See M.P.E.P. § 2143.03. Obviousness can only be established by combining or modifying the prior art teachings to produce the claimed invention if there is some teaching, suggestion, or motivation to do so found in either the references themselves or in the knowledge generally available to a person of ordinary skill in the art. See, e.g., *In re Fine*, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988); *In re Jones*, 21 USPQ2d 1941, 1943-44 (Fed. Cir. 1992). It is well established that the mere fact that

references can be combined does not render the resultant combination obvious unless the desirability of that combination is also taught or suggested by the prior art. See *In re Mills*, 16 USPQ2d 1430, 1432 (Fed. Cir. 1990). Thus, even if all elements of the claimed invention were known, this is not sufficient by itself to establish a prima facie case of obviousness without some evidence that one would have been motivated to combine those teachings in the manner proposed by the Examiner. See *Ex parte Levengood*, 28 USPQ2d 1300, 1302 (B.P.A.I. 1993).

Evidence of the teaching, suggestion or motivation to combine or to modify references may come explicitly from statements in the prior art, the knowledge of a person of ordinary skill in the art or the nature of the problem to be solved, or may be implicit from the prior art as a whole rather than expressly stated in a reference. See *In re Dembiczak*, 50 USPQ2d 1614, 1617 (Fed. Cir. 1999); *In re Kotzab*, 55 USPQ2d 1313, 1316-17 (Fed. Cir. 2000). Rigorous application of this requirement is the best defense against the subtle, but powerful, attraction of an obviousness analysis based on hindsight. See *Dembiczak* at 1617. Whether shown explicitly or implicitly, however, broad conclusory statements standing alone are not evidence because the showing must be clear and particular. See *id.*

Finally, a determination of *prima facie* obviousness requires a reasonable expectation of success. See *In re Rinehart*, 189 USPQ 143, 148 (C.C.P.A. 1976).

Claims 14 and 20 were rejected under Section 103(a) as allegedly unpatentable over Wu *et al.* in view of Tan *et al.* and Swamy *et al.* Applicants respectfully disagree.

The Examiner argues that it would have been *prima facie* obvious to make stress tolerant plants by substituting the isolated DNA encoding maize VP14 protein for the isolated DNA encoding LEA protein in the method of Wu *et al.*, because the cited prior art teach that:

- (a) Stress tolerant plants can be made by using an isolated DNA encoding an LEA protein (see Wu *et al.*)
- (b) LEA expression is induced by ABA (see Wu *et al.*)
- (c) Increased ABA levels result in increased tolerances to stresses (see Swamy *et al.*)

- (d) Maize VP14 protein is responsible for the oxidative cleavage of 9-cis-xanthophylls, which is the key regulatory step in the pathway of ABA biosynthesis (see Tan *et al.*)

Applicants do not agree with these allegations and traverse the rejection for the following reasons:

(a) Wu *et al.* do not teach a relationship between **endogenous** ABA and LEA-induced stress tolerance in plants. In other words, Wu *et al.* neither teach nor suggest that the reason for the LEA-induced stress tolerance is a result of **endogenous** ABA synthesis. The LEA expression induction as described in Wu *et al.* is due to **exogenous** ABA. This induction of LEA expression by **exogenous** ABA does not prove a direct relationship between LEA and **endogenous** ABA.

(b) The effect of ABA reported in Swamy *et al.* is also due to **exogenous** ABA. In contrast, the ABA effect in the present claims is due to **endogenous** ABA. Nothing in the cited prior art confirms that the effect of **exogenous** ABA and that of **endogenous** ABA are identical.

(c) It is true that VP14 has neoxanthin cleavage activity. However, nothing in the cited prior art shows that ABA biosynthesis is enhanced by VP14, leading to enhanced stress tolerance. Even though VP14 expression is induced by stress, it is not clear whether VP14 overexpression would lead to enhanced stress tolerance.

Thus the present invention, which succeeded in enhancing stress tolerance by endogenously expressing a neoxanthin cleavage enzyme gene within plants and increasing ABA synthesis, cannot be obvious over any of the cited references, either alone or in combination.

(d) Applicants also submit that the Examiner has not sufficiently established the motivation for "substituting the isolated DNA encoding maize VP14 protein for the isolated DNA encoding LEA protein in the method of Wu *et al.*" The Examiner contends that the motivation is to "counteract the deleterious effects of environmental stresses on plant growth and productivity," but this is not enough motivation to use the gene encoding VP14 of Tan *et al.* in place of the LEA gene of Wu *et al.* Why would anyone want to substitute the LEA gene with the VP14 gene of Tan *et al.* when the relationship

between **endogenous** ABA and LEA gene is unknown? Furthermore, Wu *et al.* do not mention any shortcoming of their method and thus, one skilled in the art would naturally expect Wu *et al.*'s method to work and be sufficient, if not the best available method at the time, for producing a stress tolerant plant. Wu *et al.*'s method alone would have enabled one to "counteract the deleterious effects of environmental stresses on plant growth and productivity" to a certain extent, without having to resort to other methods. There would have been no necessity for substituting Wu *et al.*'s gene with a new gene (i.e., one encoding VP14) that has not even been shown to lead to stress tolerance. Thus, it appears that the Examiner's combination of references is purely hindsight and unjust.

Withdrawal of the Section 103 rejection is requested.


Conclusion

Having fully responded to all of the pending objections and rejections contained in this Office Action, Applicants submit that the claims are in condition for allowance and earnestly solicit an early Notice to that effect. The Examiner is invited to contact the undersigned if any further information is required.

Respectfully submitted,

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